REMARKS

New claims 40-57 have been added. Claims 1-57 are now pending in this application.

Reconsideration of the application is earnestly requested. The Examiner is thanked for the telephone interview of February 9, 2007. The arguments below were discussed. The Examiner has suggested that claim 25 be amended to replace "machine" with "computer." That change has been made. The Examiner has also indicated that claim 1 produces no tangible result. Claim 1 has been amended to require storing of the simulation model.

Claim Rejections under 35 USC §112

Claims 1, 13 and 25 have been rejected in that the phrase "substantially . . ." renders the claims indefinite. Claims 1, 13 and 25 have also been rejected in that the limitation "the accuracy . . ." has no antecedent basis. Claims 1-13 and 25 have also been rejected in that the word "accuracy" is unclear. Applicant points out that the above phrase, limitation and word in each of these three claims have been deleted.

Applicant would also like to point out that although the "wherein" clause containing the above words has been deleted, Applicant has amended these claims to recite language from the "wherein" clause in more positive language. Claims 1, 13 and 25 each now require that "said simulation model being suitable for producing accurate hardware simulation results in a simulator." Applicant submits that the limitation "accurate hardware simulation results" is not unclear under §112 because one of skill in the art will easily understand the meaning of "accurate hardware simulation results."

Double Patenting Rejection

The Office action has rejected claims 1, 13, 25 and 39 under the judicially-created doctrine of obviousness-type double patenting in view of claims 1, 13, 24 and 34 of U.S. Patent No. 7,107,567. To obviate the provisional double patenting rejection, Applicant has included a terminal disclaimer pursuant to 37 C.F.R. §1.321. Applicant therefore respectfully requests that the double patenting rejection be withdrawn.

Claim Rejections under 35 USC §101

Claims 1, 13, 25 and 39 have been rejected because there is no tangible result. Applicant points out that claim 1 has been amended to require "creating a simulation model" and "storing said simulation model." Claim 13 is an apparatus claim and it is respectfully submitted that an apparatus need not produce a tangible result. In any case, claim 13 now requires that "said obfuscation module creating said simulation model." Claim 25 recites a computer program product and it is submitted that a tangible result is not required for a physical item.

Claim 39 now recites "A computer program product . . . comprising." It is respectfully submitted that claim 39 being a tangible computer program product need not necessarily produce a tangible result. It is therefore requested that these rejections under §101 be withdrawn.

Claim 39 has been further rejected in that it does not belong to one of the categories of invention. Now that claim 39 recites a "computer program product" it is respectfully submitted that claim 39 now belongs to one of the statutory classes of invention.

Applicant respectfully submits that the above amendments to the claims address the Examiner's rejections under §112 and §101.

Claim 39 Rejection under 35 USC §102

The Office action has rejected claim 39 under §102 as being anticipated by *Meyer*. Although the Examiner's arguments have been carefully considered, Applicant respectfully traverses this rejection as explained below.

Applicant notes from the outset that paragraph 72 of *Meyer* describes a superior encryption method "since the simulation program must store both the key and the decrypted HDL source." Thus, the disclosure of this paragraph describes an encryption technique for protection of a simulation program. But, the present application at page 2, lines 20-34 describes encryption of source code as a prior art technique that is not practical for protecting a simulation version of the core. In other words, paragraph 72 describes the prior art on which the present invention improves. Therefore, is not surprising that many of the claimed limitations of claim 39 are not taught or suggested by *Meyer*.

Claim 39 requires "a programming version of the IP core for insertion in an electronic design." Respectfully, it is pointed out that paragraph 73 of *Meyer* only discloses distribution of

an IP simulation model. There is no discussion of a programming version of the IP core. As discussed at various places in the present application, a programming version is different from a simulation model because the programming version may be used to program a programmable logic device with an electronic design. The simulation model discussed in *Meyer* at paragraphs 72 in 73 cannot be used to program a logic device; therefore, it is not "a programming version of the IP core" as required by claim 39.

Claim 39 also requires as a second element:

> wherein the simulation model includes obfuscation circuitry, absent in the programming version, which allows an accurate hardware simulation result of the IP core but prevents direct compilation of the simulation model to produce a practical hardware implementation of the IP core.

In other words, the obfuscation circuitry prevents compilation of the simulation model into a practical implementation. By contrast, paragraph 72 of *Meyer* does not disclose any obfuscation circuitry added to the simulation model that prevents a practical hardware implementation. Paragraph 72 does point out that the object code is shrouded or obfuscated, but there is no disclosure of any added circuitry. The circuitry of the simulation program of paragraph 72 is the original circuitry with no added obfuscation circuitry. The object code is apparently obfuscated via different technique. Therefore, this second element of claim 39 is not taught or suggested by *Meyer* and it is requested that the rejection of claim 39 be withdrawn.

Claim 1 Rejection under 35 USC §103

The Office action has rejected claim 1 under §103 as being obvious in view of *Jakubowski et al.* (*Jakubowski*) and *Meyer*. Although the Examiner's arguments have been carefully considered, Applicant respectfully traverses this rejection as explained below.

Applicant notes from the outset that the present invention is clearly directed toward methods and systems used to produce a simulation model of an electronic design in the context of programming a programmable logic device using an electronic design automation (EDA) system (see page 1). By contrast, *Jakubowski* deals with protecting software from illegal copying or modification. There is no disclosure in *Jakubowski* of any EDA systems, electronic designs or programmable logic devices. Therefore, is not surprising that many of the claimed features of claim 1 are not present in *Jakubowski*.

Claim 1 requires as a first step:

receiving a non-obfuscated version of the electronic design suitable for direct compilation into a practical hardware implementation of the electronic design.

The present application points out clearly that an "electronic design" generally refers to the logical structure of an electronic device such as an integrated circuit (page 9, line 33-page 10, line 9). The Office action cites column 4 as disclosing this feature, but this portion of *Jakubowski* (and the whole reference) only discloses a software product. There is no discussion of an electronic design that represents an integrated circuit. It is true that an electronic design may be represented in software, but an electronic design still embodies the logical structure of an electronic device. There is no disclosure in *Jakubowski* of any software that embodies an electronic design.

Further, this first step of claim 1 requires that the electronic design is suitable "for direct compilation into a practical hardware implementation." The cited portion of *Jakubowski* (and the whole reference) does not disclose any software that is suitable for compilation into a hardware implementation.

The second step of claim 1 requires:

adding obfuscation circuitry to said electronic design to produce an obfuscated version of the electronic design.

Again, the cited portion of *Jakubowski* only discloses software that is protected in some manner. For example, column 3 discloses that the software is parsed and various types of protection are applied. But, there is no disclosure in *Jakubowski* of any type of circuitry that is added to an electronic design. The various types of protection disclosed in *Jakubowski* only manipulate the software in some manner; no additional circuitry is being added.

The second step of claim 1 also requires:

wherein said obfuscation circuitry prevents practical implementation of the electronic design on a target hardware device.

Again, *Jakubowski* does not disclose any added circuitry that prevents implementation on a hardware device. The obfuscation techniques of *Jakubowski* might prevent illegal copying, or render illegal copies easily identifiable, but none of the techniques of *Jakubowski* prevent implementation of an electronic design on a hardware device.

The third step of claim 1 requires:

creating a simulation model using said obfuscated version of said electronic design.

Meyer does disclose in paragraph 96 a simulator that executes system simulation. But, claim 1 requires that the simulation model is created using the obfuscated version of the electronic design. *Meyer* does not teach or suggest a simulation model that is created from an obfuscated version of the electronic design. If anything, the simulation model of *Meyer* is based upon the original electronic design. There is no disclosure in *Meyer* of an obfuscated version of the electronic design that includes added obfuscation circuitry.

It is submitted that none of these above limitations of claim 1 are present in the references as cited, and it is requested that this rejection of claim 1 be withdrawn.

Rejection of Claims 13 and 25

The Office action has also rejected claims 13 and 25 under §103 as being obvious in view of *Jakubowski* and *Meyer*. Claims 13 and 25 each require similar limitations as claim 1 are believed patentable for the same reasons given above.

Rejection of claims 37 and 38

The Office action has also rejected claims 37 and 38 under §103 as being obvious in view of *Jakubowski* and *Meyer*. Claims 37 and 38 each require similar limitations as claim 1 and are believed patentable for the same reasons given above.

For example, claim 37 requires:

f) producing a simulation model using said optimized IP core that includes said inserted entangler and inserted scrambler circuitry.

Meyer does disclose in paragraph 96 a simulator that executes system simulation. But, claim 37 requires that the simulation model is created using the optimized IP core that includes the entangler and scrambler circuitry. *Meyer* does not teach or suggest a simulation model that is created from an optimized IP core that includes the recited additional circuitry. If anything, the simulation model of *Meyer* is based upon the original electronic design. There is no disclosure in *Meyer* of an optimized IP core that includes added entangler and scrambler circuitry.

Claim 38 requires:

(f) producing a simulation model using said optimized IP core that includes said inserted obfuscation circuitry.

Meyer does disclose in paragraph 96 a simulator that executes system simulation. But, claim 38 requires that the simulation model is created using the optimized IP core that includes the inserted obfuscation circuitry. *Meyer* does not teach or suggest a simulation model that is created from an optimized IP core that includes inserted obfuscation circuitry. If anything, the simulation model of *Meyer* is based upon the original electronic design. There is no disclosure in *Meyer* of an optimized IP core that includes inserted obfuscation circuitry.

Dependent Claims 46-51

Since the dependent claims depend from the independent claims, it is respectfully submitted that they are each patentable over the art of record for at least the same reasons as set forth above with respect to the independent claims. Further, each of the dependent claims require additional features that when considered in light of the claimed combination further distinguish the claimed invention from the art of record. For example, claims 46-51 each specifically require that the simulation model is cycle accurate and bit accurate. The advantage is that even though the simulation model might include some form of obfuscation circuitry that prevents a practical hardware implementation, the simulation model will still produce an accurate simulation result for a hardware developer. Claims 46-51 require a cycle accurate and bit accurate simulation model, terminology that is understood and appreciated by those of skill in the art.

Reconsideration of this application and issuance of a Notice of Allowance at an early date are respectfully requested. If the Examiner believes a telephone conference would in any way expedite prosecution, please do not hesitate to telephone the undersigned at (612) 252-3330.

Respectfully submitted,
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